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Technical Report 871

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Construction of Realistic Messages from Computer-Generated Alert Messages

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U.S. Army Research Institute

James M. Linville
Vreuls Research Corporation

February 1990

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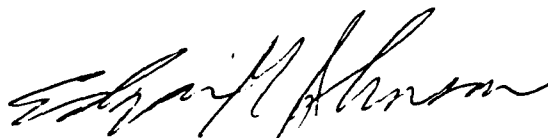
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FOREWORD

The U.S. Army Research Institute, Fort Leavenworth Field Unit, conducts a systems and training research program in support of the Combined Arms Center (CAC).

For several years the Field Unit has been involved in research to support the development and use of computer-driven battle simulations for training battalion through division command groups. A pressing problem with the current generation of battle simulations is the burden placed upon controllers, who must, in addition to many other duties, generate a stream of realistic tactical messages. The current research compares a set of messages created from computer-generated battle simulation alerts with actual field training exercises messages.

This research was an exploratory effort funded under Research Task 1301. It will contribute to identification of requirements for an automated system to translate simulation output into more realistic messages, thereby improving training realism and reducing controller overload.



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CONSTRUCTION OF REALISTIC MESSAGES FROM COMPUTER-GENERATED ALERT MESSAGES

EXECUTIVE SUMMARY

Requirement:

Role players at computer-assisted command post exercises (CPXs) use the alert messages provided by the computer to generate an information stream of realistic tactical messages. Typically, CPX messages fall short, in realism, of messages produced at Field Training Exercises (FTXs). This study was designed to determine whether it is possible to create realistic messages using only the material readily available to CPX controllers and to provide guidance on how such messages can be constructed.

Procedure:

A set of 24 messages (the "bogus" messages) was created using the computer-generated alert messages from ARTBASS (Army Training Battle Simulation System) exercises. Thirty-one company grade officers were shown the bogus messages, along with 24 messages created by controllers in actual CPXs and 24 messages from actual FTXs. For each message, the participant was asked to judge whether the message originated in an FTX or CPX environment and to evaluate the message on four semantic differential scales: wordy-succinct, vague-precise, worthless-valuable, and calm-excited.

Findings:

The bogus and FTX messages were equally likely to be judged as coming from an FTX, but the actual CPX messages were less likely than either bogus or FTX to be judged as coming from an FTX. A discriminant function, based on the semantic differential ratings of the FTX and CPX messages, classified two-thirds of the bogus messages as FTX-like. Therefore, it is possible to create messages that are more FTX-like than usually found in CPXs. Analysis of the set of bogus messages indicates that adding a degree of uncertainty to the message, describing terrain or equipment, making predictions about the future, and summarizing detailed reports into a general description tend to improve message realism.

Utilization of Findings:

Information provided in this report can be used both to improve the training of role players and to design battle simulation interfaces that support the creation of realistic messages.

CONSTRUCTION OF REALISTIC MESSAGES FROM COMPUTER-GENERATED ALERT MESSAGES

CONTENTS

	Page
INTRODUCTION	1
METHOD	2
Data Collection Software and Procedures	2
Participants	3
Companion Study	3
RESULTS	3
Message Identification	3
Semantic Differential Ratings	4
DISCUSSION	4
REFERENCES	17

LIST OF TABLES

Table 1. Message identification--percent judged as FTX	3
2. List of alert messages and bogus messages	5

CONSTRUCTION OF REALISTIC MESSAGE FROM COMPUTER-GENERATED ALERT MESSAGES

Introduction

Command post exercises (CPXs) are an important part of the Army's command and staff training. Most CPXs employ a dynamic computer-assisted simulation in which units and weapon systems are modeled. CPXs provide a way to train command post staffs that is significantly less expensive than Field Training Exercises (FTXs), which involve actual troop deployments. In computer assisted CPXs, the plans and orders of the staff being trained are entered into the computer and the computer determines combat outcomes and reports battle events in the form of alert messages. Control personnel serve to insulate the training audience from the computer. There are two main aspects to this controller function. The first involves control of the model. The controllers must translate the directives of the training audience into input to the computer and usually must provide additional entry to keep the entities represented in the computer behaving realistically. The second main controller function is role playing, in which the simulated events described by the computer are converted into messages and then are transmitted to the training audience.

The role playing function can be difficult to perform well (Solick & Lussier, 1988). The alert messages provided to the controllers by the computer convey the "ground truth" representation of the computer rather than the information which would normally be available to the person whose role the controller is playing. For example, a controller playing a subordinate unit commander might acquire information about the enemy. The computer would give him the enemy unit designation and grid location. It would be unrealistic, however, to transmit such precise information to the training audience. Also, the computer often reports several aspects of the same event separately, for example detection of an enemy unit, receipt of direct or indirect fire, and change of status to hasty defense would be separate alert messages from the computer but should logically be combined when reported to the command post.

A companion study (Keene, Solick, & Lussier, 1990) compared transcribed radio messages from ARTBASS (Army Training Battle Simulation System) exercises (CPX) and transcribed radio messages from National Training Center exercises (FTX). The soldier creating the FTX messages, unlike the soldier in the CPX, was describing events that he was observing so that the FTX messages were presumably more realistic. In that study, Army officers could correctly identify whether the message came from CPX or FTX significantly above chance. Additionally the CPX messages were judged to be more succinct, more precise, and more valuable than the FTX messages. While the officers' performance at identifying the message source was better than chance, it was not as accurate as the authors had expected; 58% of the message sources were correctly identified (and 42% were incorrectly identified).

Messages in CPXs could be improved by changing the computer software so that the alert messages provided more closely resemble the desired radio transmission. Alternatively, the controllers could be provided some training on how

to transform the alert messages. Both solutions are feasible; however, the first is probably more difficult and expensive although it may be more effective in the long run.

In this study, messages were created using alert messages from an ARTBASS exercise. An attempt was made to make the created messages more realistic than those typically found in CPXs. The created messages, along with actual FTX and CPX messages were presented to officers with experience in both FTXs and CPXs and the officers were asked to judge the source of the message. The goal was to produce a set of messages which had been generated from materials available to the CPX controller but which were judged to be more like the messages found in FTXs than CPXs. Such a set of messages, along with the alert messages from which they were created, would serve as examples of the desired transformation and could be used to guide both the training of controllers and the development of software to improve alert messages.

Method

Data Collection Software and Procedures: Data for this study were obtained through the use of MSGJUDGE software developed by Vruels Research Corporation under contract to the Army Research Institute (see Solick, Libehaber, Obermayer, Linville, and Obermayer, 1989). MSGJUDGE is a measurement instrument for the computer administration of a set of messages from two or more different environments to a panel of expert judges. Data are collected in the form of responses to semantic scales, forced-choice questions, and a summary questionnaire. The software was pilot tested prior to use in this study. Information concerning the pilot data collection is contained in Solick, et al., (1989).

In the present study, 24 "Bogus" messages were created using materials from an ARTBASS exercise, including the ARTBASS alert messages, the exercise maps, the operations order, and the unit's standard operating procedure manual. The Bogus messages, along with 24 actual CPX and 24 actual FTX messages were presented, in random order, to each participant. CPX, FTX and Bogus messages were composed of two subgroups of 12 messages each. One subgroup contained messages whose content concerned operational information or reports on friendly forces. The second subgroup contained messages whose content concerned enemy operations or reports about enemy activity, units, or equipment.

For administration, a participant was presented with a stimulus message which was displayed across the top of his computer screen and each of four bi-polar scales successively occupied the screen below. The four semantic scales used for this study were: wordy-succinct; vague-precise; worthless-valuable; and calm-excited. For any given message, all of the semantic scales were administered one at a time until all measurement was complete for that message. The following example shows the configuration of the screen for the semantic measurement.

 Message: We have detected 2 BMP at 256 947.

-3 -2 -1 0 1 2 3
 Wordy : : : : : : : Succinct
 ↑
 Pointer

The next screen showed the same message with another semantic scale, and this was repeated until all four scales were administered. At that time, a new message was presented and the sequence continued.

When all messages had been presented for semantic measurement, the same messages were again presented in a forced-choice format (CPX or FTX). The screen configuration for this segment of the measurement is shown in the following example:

 Message: We have detected 2 BMP at 256 947.

In this message from a CPX or FTX?
 Enter first letter from choice:

Participants: The participants in this study were 31 company grade combat arms officers (6 2Lt.; 16 1Lt.; 9 Cpt.) who volunteered their time during May, 1988.

Companion Study: The data collected in this study are also analyzed in a companion study (Keene, Solick and Lussier, in preparation). The companion study reports the differences between the CPX and FTX messages; this study focuses on the Bogus messages.

Results

Message Identification: Participants were asked to judge whether the source of the message was FTX or CPX. The percent of messages identified as FTX is shown in Table 1.

Table 1

Message Identification - Percent Judged as FTX

	CPX	FTX	BOGUS
Enemy	56%	63%	66%
Friendly	43%	68%	61%
Enemy & Friendly Combined	50%	66%	63%

A two-way analysis of variance showed that the source of the message made a significant difference in whether the message was likely to be judged as coming from an FTX ($F=7.2$, $p<.01$). A Tukey test showed that the FTX and Bogus messages were not significantly different from one another and both were more likely ($p<.01$) to be judged as coming from an FTX than was a CPX message. There was no significant difference between friendly and enemy messages nor was there a significant interaction between type of message and source of the message.

Semantic Differential Ratings: Messages were rated on four semantic differential scales: wordy-succinct, vague-precise, worthless-valuable, and calm-excited. A discriminant function was calculated based on the ratings given to the FTX and CPX messages, and the Bogus messages were classified based on the discriminant function. By this method, 66% of the Bogus messages were classified as FTX messages. Therefore, classification of the Bogus messages based on the attributes measured by the semantic differential scales produced a very similar result to the judgments of the participants in which 63% of the Bogus and 66% of the actual FTX messages were considered to be from an FTX.

Discussion

Evidently, it is possible, using only the ARTBASS alert messages, and other information available to controllers, to create messages which are as realistic as FTX messages. The CPX messages which were randomly drawn from the ARTBASS exercises, however, did not reach the same level of realism as the Bogus messages.

Table 2 lists each of the 24 Bogus messages in order of how many participants thought the message came from an FTX. Thus, messages at the beginning of the list are probably the best, while the messages at the end of the list were more often judged to be from a CPX. Also included are the ARTBASS alert messages which were used to construct the Bogus message and any additional knowledge which was required but not contained in the alert messages.

Table 2

List of Alert Messages and Bogus Messages

1. ALERT MESSAGES:

*SCT HQ VISUALLY DETECTED AT NK 320 282
1 BMP

BOGUS MESSAGE:

I've got an enemy OP at grid 320 280. I can see his antennas. He's looking right down on me.

PERCENTAGE OF PARTICIPANTS RESPONDING FTX: 90.

ADDITIONAL INFORMATION REQUIREMENTS:

Knowledge of enemy artillery equipment.

2. ALERT MESSAGES:

*HQ/B/3-41 VISUALLY DETECTED AT NK 320 321
1 T64

BOGUS MESSAGE:

I've got a lone T-64 off to the North of my position. Looks like it may be disabled, but can't tell for sure.

PERCENTAGE OF PARTICIPANTS RESPONDING FTX: 8%.

ADDITIONAL INFORMATION REQUIREMENTS: None.

3. ALERT MESSAGES:

*1/C/3-41 NK 359 303 FIRING STARTED AT-
DIR FM NONE
IND FM 2 BN/130 HOW
DIR ON NONE
IND ON NONE

*2/C/3-41 NK 358 302 FIRING STARTED AT-
DIR FM NONE
IND FM 2 BN/130 HOW
DIR ON NONE
IND ON NONE

*1/C/3-41 NK 359 303 UNDER LIGHT SUPPRESSION
*2/C/3-41 NK 358 302 UNDER LIGHT SUPPRESSION
*1/C/3-41 NK 359 303 UNDER MODERATE SUPPRESSION
*2/C/3-41 NK 358 302 UNDER MODERATE SUPPRESSION
*1/C/3-41 NK 359 302 UNDER MODERATE SUPPRESSION
*1/C/3-41 NK 359 302 UNDER MODERATE SUPPRESSION
*1/C/3-41 NK 359 302 UNDER MODERATE SUPPRESSION

*HQ/C/3-41 NK 374 292 FIRING STARTED AT-
DIR FM NONE
IND FM 50 GH BN/49
DIR ON NONE
IND ON NONE

BOGUS MESSAGE:

We are catching incoming from everywhere. My two lead platoons are under constant fire. Receiving incoming at my location, also.

PERCENTAGE OF PARTICIPANTS RESPONDING FTX: 87.

ADDITIONAL INFORMATION REQUIREMENTS: None.

4. ALERT MESSAGES:

*HQ/B/3-41 VISUALLY DETECTED AT 300 298
4 MI-24 (D)

BOGUS MESSAGE:

Hind Ds, Hind Ds low to the South West. Looks like four of them.

PERCENTAGE OF PARTICIPANTS RESPONDING FTX: 81.

ADDITIONAL INFORMATION REQUIREMENTS: None.

5. ALERT MESSAGES:

*HQ/D/2-252 VISUALLY DETECTED AT NK 300 298
3 BMP

*C/1/172 NK 301 298 FIRING STARTED AT
DIR FM NONE
IND FM C/1-3
DIR ON NONE
IND ON NONE

BOGUS MESSAGE:

I've got three BMP's on a hill to my NorthWest. Looks like a command group of some kind. I've got indirect going in on it now.

PERCENTAGE OF PARTICIPANTS RESPONDING FTX: 77.

ADDITIONAL INFORMATION REQUIREMENTS: Terrain Information.

6. ALERT MESSAGES:

*SCT 2 VISUALLY DETECTED AT NK 436 270 -1 BMP
*SCT 2 NK 428 271 OPSTATE CHANGE FROM RECON TO HASTY DEFENSE
*SCT 2 NK 434 273 FIRING STARTED
DIR FM 2/C/1/172
IND FM NONE
DIR ON SCT 2 OP 5
IND ON NONE
*SCT 2 NK 434 273 CASUALTY/LOSS REPORT
2 PERSONNEL 1 FIGHTING-1

BOGUS MESSAGE:

We got caught in a fire fight with small force with BMPs. I have two personnel injured and one fighting vehicle disabled. Force was at grid 436 270. I believe we damaged one BMP.

PERCENTAGE OF PARTICIPANTS RESPONDING FTX: 77.

ADDITIONAL INFORMATION REQUIREMENTS: None.

7. ALERT MESSAGES:

*3/B/3-41 VISUALLY DETECTED AT NK 307 314
4 T-72
2 BMP
17 PERSONNEL
*3/B/3-41 VISUALLY DETECTED AT NK 308 316
4 BMP

BOGUS MESSAGE:

We've got BMPs and T-72s reported by my third platoon. Possibly a company minus or a reinforced platoon. Looks like they're moving to the East to meet us.

PERCENTAGE OF PARTICIPANTS RESPONDING FTX: 71.

ADDITIONAL INFORMATION REQUIREMENTS: Attempt to anticipate battlefield.

8. ALERT MESSAGES:

*HQ/A/2-252 NK 329 295 WAS 22KPH MTD IS 0 KPH
*1/A/2-252 VISUALLY DETECTED AT NK 329 293
1 T72
3 BMP

BOGUS MESSAGE:

We've hit another obstacle, concertina and logs, at 329 295. My first platoon reports 1 T-72 and three BMPs at 329 293. Looks like he is after us.

PERCENTAGE OF PARTICIPANTS RESPONDING FTX: 71.

ADDITIONAL INFORMATION REQUIREMENTS: Intsum.

9. ALERT MESSAGES:

*2/D/2-252 VISUALLY DETECTED AT NK 351 297
2 BMP 1 T-72
*2/D/2-252 VISUALLY DETECTED AT NK 329 293
2 BMP 1 T-72
*2/D/2-252 NK 368 217 FIRING STARTED AT
DIR FM 1/B/1/172
IND FM NONE
DIR ON 1/B/1/172
IND ON NONE

BOGUS MESSAGE:

My second platoon is hooked up with a BMP and tank force. They got hit about 0645, returning fire now.

PERCENTAGE OF PARTICIPANTS RESPONDING FTX: 71.

ADDITIONAL INFORMATION REQUIREMENTS: None.

10. ALERT MESSAGES:

*HQ/D/2-252 NK 361 279 UNDER HEAVY SUPPRESSION
*2/D/2-252 NK 368 277 UNDER HEAVY SUPPRESSION
*1/D/2-252 VISUALLY DETECTED AT NK 329 293
2 BMP 1 T-72
*1/D/2-252 NK 364 278 FIRING STARTED AT
DIR FM 1/B/1/172
IND FM NONE
DIR ON 1/B/1/172
IND ON NONE
*1/D/2-252 NK 364 278 CASUALTY/LOSS REPORT
4 PERSONNEL 1 M-1 TANK
*1/D/2-252 NK 364 278 UNDER MODERATE SUPPRESSION

BOGUS MESSAGE:

It's not getting any better out here. I've got incoming at my location, 2nd platoon and 1st platoon are catching it too. Got tanks and BMPs at 329 293, 1st platoon is engaging. They've lost some people and have a shooter down. Need to get some counter-battery going. Talked to my FO, he's trying to crank arty now.

PERCENTAGE OF PARTICIPANTS RESPONDING FTX: 68.

ADDITIONAL INFORMATION REQUIREMENTS: None.

11. ALERT MESSAGES:

*2/D/2-252 NK 368 277 CASUALTY/LOSS REPORT
4 PERSONNEL 1 M-1 TANK
*2/D/2-252 NK 368 277 IS REDCON 4 DUE TO PERSONNEL

BOGUS MESSAGE:

Second platoon got hit hard, looks like 4 KIA and 1 Big Boy is out of it. They can't continue until we get some people to them. I'm going to have them go to ground right where they are.

PERCENTAGE OF PARTICIPANTS RESPONDING FTX: 68.

ADDITIONAL INFORMATION REQUIREMENTS: None.

12. ALERT MESSAGES:

*1/D/2-52 NK 364 278 OPSTATE CHANGE FROM ATK TO HASTY DE
*2/D/2-52 NK 363 249 OPSTATE CHANGE FROM ATK TO HASTY DE
*SCT/2 NK 362 261 DETECTED ANTI VEH MINFLD
*2/A/K/172 NK 365 270 FIRING STARTED AT
DIR FM NONE
IND FM B/1-3
DIR ON NONE
IND ON NONE

BOGUS MESSAGE:

My arty guy finally got cranked up. Should be able to breach this thing pretty quick now.

PERCENTAGE OF PARTICIPANTS RESPONDING FTX: 68.

ADDITIONAL INFORMATION REQUIREMENTS: None.

13. ALERT MESSAGES:

*2 BN/130 HOW NK 312 304 FIRING STARTED AT
DIR ON NONE
IND ON 1/B/3-41
DIR FM NONE
IND FM NONE
*1/B/3-41 VISUALLY DETECTED AT 300 298
2 MI-24 (D)

BOGUS MESSAGE:

First platoon reports two Hind Ds visible to the South West. Don't know what they are doing. Artillery still has them bottled up.

PERCENTAGE OF PARTICIPANTS RESPONDING FTX: 65.

ADDITIONAL INFORMATION REQUIREMENTS: None.

14. ALERT MESSAGES:

*HQ/C/3-41 NK 358 302 FIRING STARTED AT-
DIR FM NONE
IND FM 2 BN/130 HOW
DIR ON NONE
IND ON NONE
*HQ/C/3-41 NK 359 303 UNDER LIGHT SUPPRESSION
*HQ/C/3-41 NK 359 303 UNDER MODERATE SUPPRESSION
*HQ/C/3-41 NK 359 303 FIRING STARTED AT-
DIR FM NONE
IND FM 50 GH BN/49
DIR ON NONE
IND ON NONE
*HQ/C/3-41 VISUALLY DETECTED AT 361 305
2-T 72
8-BMP

BOGUS MESSAGE:

We are continuing to get incoming. Looks like a large force is moving East to West toward our location. At least one T-72 and some BMPs.

PERCENTAGE OF PARTICIPANTS RESPONDING FTX: 61.

ADDITIONAL INFORMATION REQUIREMENTS: None.

15. ALERT MESSAGES:

*1/C/3-41 NK 359 303 UNDER MODERATE SUPPRESSION
*1/C/3-41 NK 359 303 UNDER MODERATE SUPPRESSION
*HQ/C/3-41 VISUALLY DETECTED- 2BMP, 1 T-72 AT NK 329 293

BOGUS MESSAGE:

My lead platoon is still getting incoming artillery and I have an armor force approaching from the West. Unable to maneuver or engage.

PERCENTAGE OF PARTICIPANTS RESPONDING FTX: 58.

ADDITIONAL INFORMATION REQUIREMENTS: None.

16. ALERT MESSAGES:

*1/D/2-252 NK 364 278 UNDER MODERATE SUPPRESSION
*1/D/2-252 NK 362 281 FIRING STARTED AT
DIR FM 1/B/1/172
IND FM 2 BN/130 HOW
DIR ON 1/B/1/172
IND ON NONE
*1/D/2-252 NK 362 281 CASUALTY/LOSS REPORT
4 PERSONNEL 1 M-1 TANK
*2/D/2-252 NK 364 282 FIRING STARTED AT
DIR FM NONE
IND FM 2 BN/130 HOW DIR ON 1/B/1/172
IND ON NONE
*3/D/2-252 NK 368 279 FIRING STARTED AT
DIR FM NONE
IND FM 2 BN/130 HOW
DIR ON NONE
IND ON NONE
*HQ/D/2-252 NK 365 279 WAS 0 KPH DSMTD IS 3KPH MTD

BOGUS MESSAGE:

I'm moving my elements off to the North. If I can get 1st platoon to break contact I'll move. 1st platoon has lost another main gun and 2nd and 3rd platoons are right in the middle of the artillery.

PERCENTAGE OF PARTICIPANTS RESPONDING FTX: 55.

ADDITIONAL INFORMATION REQUIREMENTS: None.

17. ALERT MESSAGES:

*1/B/3-41 NK 318 302 WAS 44KPH MTD IS 0KPH MTD
*1/B/3-41 NK 318 304 FIRING STARTED AT
DIR FM 2/A/TK/172
IND FM NONE
DIR ON 2/A/TK/172
IND ON NONE
*1/B/3-41 NK 318 304 CASUALTY/LOSS REPORT
6 PERSONNEL 1 M-1 TANK 8 M16

BOGUS MESSAGE:

My lead elements report hitting a minefield at 319 305. They are under direct fire. At least one big boy is down and a half dozen casualties.

PERCENTAGE OF PARTICIPANTS RESPONDING FTX: 55.

ADDITIONAL INFORMATION REQUIREMENTS: None.

18. ALERT MESSAGES:

*SCT 2 NK 434 273 FIRING STARTED
DIR FM 2/C/1/172
IND FM NONE
DIR ON SCT 2 OP 5
*OPS NK 433 272 FIRING STARTED
DIR FM 2/C/1/172
IND FM NONE
DIR ON NONE
IND ON NONE

BOGUS MESSAGE:

We're catching fire from our South East from an unknown size unit. No damage, preparing to engage with indirect.

PERCENTAGE OF PARTICIPANTS RESPONDING FTX: 52.

ADDITIONAL INFORMATION REQUIREMENTS: None.

19. ALERT MESSAGES:

*SCT 2 NK 434 273 UNDER MODERATE SUPPRESSION

BOGUS MESSAGE:

We've been located, taking incoming at this time.

PERCENTAGE OF PARTICIPANTS RESPONDING FTX: 48.

ADDITIONAL INFORMATION REQUIREMENTS: None.

20. ALERT MESSAGES:

*SCT HQ VISUALLY DETECTED AT NK 443 295 -1 BMP
*SCT HQ NK 443 295 FIRING STARTED AT-
DIR FM 3/C/1/172
IND FM NONE
DIR ON 3/C/1/172
IND ON NONE
*SCT HQ NK 443 295 DESTROYED FOLLOWING ENEMY VEHICLE- 1BMP

BOGUS MESSAGE:

Engage in a fire fight with a platoon size element, located at grid 443 295. Destroyed one BMP, no friendly casualties.

PERCENTAGE OF PARTICIPANTS RESPONDING FTX: 45.

ADDITIONAL INFORMATION REQUIREMENTS: None.

21. ALERT MESSAGES:

*2/D/2-252 NK 368 277 IS REDCON 4 DUE TO PERSONNEL.

*2/D/2-252 NK 368 277 UNDER HEAVY SUPPRESSION.

BOGUS MESSAGE:

Second platoon getting artillery now. I can't get them out of there without more people. Can the artillery be located for counterbattery?

PERCENTAGE OF PARTICIPANTS RESPONDING FTX: 45.

ADDITIONAL INFORMATION REQUIREMENTS: Knowledge that counterbattery fire can remove artillery suppression.

22. ALERT MESSAGES:

*1/B/3-41 NK 318 302 WAS 44KPH MTD IS OKPH MTD

*1/B/3-41 NK 318 304 FIRING STARTED AT

DIR FM 2/A/TK/172

IND FM NONE

DIR ON 2/A/TK/172

IND ON NONE

*1/B/3-41 NK 318 304 CASUALTY/LOSS REPORT

6 PERSONNEL 1 M-1 TANK 8 M16

*1/B/3-41 NK 319 304 FIRING STARTED AT

DIR FM 1/A/TK/172

IND FM NONE

DIR ON 1/A/TK/172

IND ON NONE

BOGUS MESSAGE:

He's catching it hard from the South. At least a reinforced platoon is hitting him.

PERCENTAGE OF PARTICIPANTS RESPONDING FTX: 42.

ADDITIONAL INFORMATION REQUIREMENTS: None.

23. ALERT MESSAGES:

*2/D/2-252 NK 308 317 FIRING STARTED AT
DIR FM 1/B/1/172
IND FM NONE
DIR ON 1/B/1/172
IND ON NONE
*2/D/2-52 NK 308 317 CASUALTY/LOSS REPORT
8 PERSONNEL
*2/DS/2-252 NK 308 317 OPSTATE CHANGE FROM ATK TO HASTY DE

BOGUS MESSAGE:

My Western element is hooked up with four T-64's, got them completely stopped and taking casualties. Grid 309 316, four T-64's.

PERCENTAGE OF PARTICIPANTS RESPONDING FTX: 42.

ADDITIONAL INFORMATION REQUIREMENTS: Knowledge of enemy unit type.

24. ALERT MESSAGES:

*1/C/3-41 NK 411 260 DIESEL FUEL LOW
*1/C/3-41 NK 413 261 OPSTATE CHANGE FROM MVT CNT TO HASTY DE
*HQ/C/3-41 NK 398 289 0940 CASUALTY/LOSS REPORT
4 PERSONNEL
2 FUEL TRK

BOGUS MESSAGE:

My first platoon has run dry. Completely out of diesel. Best they can do is stay where they are.

PERCENTAGE OF PARTICIPANTS RESPONDING FTX: 39.

ADDITIONAL INFORMATION REQUIREMENTS: None.

As can be seen in Table 2, very little information beyond what is contained in the alert messages is required to produce good radio messages for the training audience. Occasionally, knowledge of equipment and terrain add realism, for example, message #1 and #5 in Table 2. Adding some degree of uncertainty also makes messages more like FTX messages, for example, #2, #4 and #6. Other useful techniques are making predictions about the future, e.g. #7, #8, and #12, and summarizing several detailed reports into a general description, e.g., #3, #10, and, #14. These techniques can be seen in the following examples of actual FTX and CPX messages. The percentage of participants who judged the origin of the message as FTX is indicated in parenthesis. Further information about the FTX and CPX messages can be found in Keene, Solick and Lussier (in preparation).

FTX messages:

As far as I know, they have passed. (71)

I'm coming that way. I'm headed right for your own position. I'll reinforce you and meet you there. (81)

My element in 60 North had nothing to shoot at. I'm moving him to get the enemy in the rear. (52)

Roger, we're taken down. There's only one left. He's headed for Uniform. One T72 and one BMP left. (77)

Roger, I anticipate a small penetration. Right now we are counter attacking. I will keep him informed. (52)

Observing artillery, grid 585 170. Continuing mission. (65)

CPX messages:

Have destroyed 1 APC vicinity 366 920. Have visually detected 9 personnel at 336 956. Northern element has also detected 9 personnel at same location. (63)

Roger, one more confirmed kill on BMP at 372 891. (65)

Element at 466 930 under heavy air attack. (32)

Spot report: 3 BMPs moving East grid 394 968. Also 2 more BMPs moving East grid 285 957. Taking fire at this time. (52)

I've got visual detection, 5 T64s, vicinity 361 906, has returned fired. Have one confirmed kill. (52)

Roger same element has destroyed 1 BRDM located 388 927. (39)

In conclusion, this study shows that it is possible to produce more realistic messages in CPXs using only the information readily available to controllers. Both providing improved training for the controllers and altering the output of the computer are feasible alternatives.

References

- Keene, S. D., Solick, R. E., and Lussier, J. W. (In preparation, 1990). Identification of CPX and FTX Messages (ARI Technical Report 875). Alexandria, VA: U.S. Army Research Institute for the Behavioral and Social Sciences.
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